costs presents significant difficulties, however, and any allocation necessarily will have some indeterminacy. Hence, as AT&T and MCI have previously urged, it is critical that the Commission not adopt an allocation standard that exacerbates the problems with this separation process. AT&T and MCI Comments at 12-13 (filed August 8, 1997). Most importantly, the selected mechanism should be manufacturer neutral thereby preventing universal service subsidies from becoming sensitive to the particular mix of switching vendors, encouraging uneconomic decision-making in switch purchases, and violating forward-looking economic principles. The Hatfield Model adopts a better approach of assigning 30% of total switch investment to the port, an allocation that has been supported by publicly available cost studies.[35] If the Commission determines pursuant to its Access Charge Reform Order that a different percentage allocation is appropriate, then the Hatfield Model can be adjusted accordingly. See FNPRM ¶ 135.

AT&T and MCI also support the Commission's tentative conclusion that "all of the port cost and a percentage of the usage cost are costs of providing universal service" and that local usage, as a percentage of other usage, should be allocated to universal service. FNPRM ¶ 137. The Hatfield Model already employs exactly such an approach, determining the cost of local usage based upon the level of local usage in a study-area. Id. ¶ 134.

D. Interoffice Trunking, Signaling, and Local Tandem Service Inputs

As the Commission properly recognized, the Hatfield Model is the only cost mechanism that currently calculates separate costs for the network elements used to provide interoffice

[35] New York Study, Case 0657:94-C0095 & 91-C1174, Workpapers Part B at 93 (average 24% of line port); Massachusetts Study, 96-73/74: 96-75: 96-80/81: 96-83: 96-94 (filed Oct. 24, 1996) Workpaper Part B at 73 (average 43% of line port).

trunking, signaling, and local tandem services. FNPRM ¶ 141.[36] In addition, as AT&T and MCI have repeatedly demonstrated, the Model uses conservative platform characteristics to ensure the universal service costs are not underestimated. And the Model allows the user to exercise significant control over this estimation algorithm by including over 60 user adjustable input values. The HIP references the publicly available data and engineering and network design justifications supporting the reasonableness of these input values. HIP at 68-104. AT&T and MCI will respond to specific criticisms of these values, if any, in their reply comments.

IV. THE HATFIELD MODEL USES FORWARD-LOOKING ASSET LIVES.

The Hatfield Model incorporates a weighted average of the Commission's asset lives as determined in a three-party review process including the relevant state commission, the incumbent LEC, and the Commission. See HIP at 106. In general, the depreciation lives prescribed by the Commission are forward-looking and fully appropriate for use in TELRIC cost studies. Over a decade ago the Commission directed its staff to put less emphasis on historic data in estimating projection lives, instead directing that prescribed depreciation lives should reflect "company plans, technological developments, and other future oriented analysis." Report on Telephone Indus. Depreciation, FCC Tax and Capital/Expense Policy, Accounting and Audits Division, at 3 (April 15, 1987). In this regard the Commission has stated that in prescribing life ranges, it would rely on "statistical studies of the most recently prescribed factors. These statistical studies required detailed analysis of each carrier's most recent retirement patterns, the carrier's plans, and the

[36] The BCPM sponsors have promised to include this feature in a new version of their model, but they have yet to demonstrate satisfactorily that they can deliver on this promise.

current technological developments and trends." Simplification of the Depreciation Prescription Process, CC Docket No. 92-296, at 6 (May 4, 1995). As such, the lives prescribed by the Commission assure forward-looking capital recovery.

Indeed, the Commission recently reaffirmed that its prescribed lives are forward-looking in its Second Report and Order in the Price Cap Performance Review, CC Docket No. 94-1 (May 21, 1997). There, the Commission expressly rejected claims by incumbent LECs that the Commission's prescribed lives did not provide for economic depreciation rates:

> [T]here is no sound basis in the record in this proceeding for determining whether and to what extent our depreciation rates differ from economic depreciation rates. . .[U]nder our recently established streamlined procedures for determining LEC depreciation rates, incumbent LECs have considerable influence and some discretion in setting their specific depreciation rates. Commentors in this proceeding have not persuaded us that the depreciation rates we have currently prescribed do not reflect the LECs' depreciation costs.

Id. ¶ 63 (emphasis added).

Contrary to the assertion of some incumbent LECs (see FNPRM ¶ 151), asset lives should not be shortened in response to speculative forecasts of possible future competitive pressures. Such asset lives already incorporate best anticipations about such pressures. Indeed, before any such adjustment could be justified, an incumbent LEC would need to demonstrate that it is, in fact, facing significant facilities-based competition that renders part of its plant economically unusable. No incumbent LEC has done so or conceivably could do so. There is no significant local competition in most areas of the country today, and it remains uncertain when and even whether significant facilities-based competition will occur in many areas, including the rural and high cost areas most relevant for universal service purposes. And even if a few customers are lost to exclusively facilities-based competitors, growth in customer demand will almost certainly guarantee the continued full use of incumbents' network facilities. As AT&T discovered following the divestiture of the regional Bell Operating Companies, a decrease in market share does not necessarily mean that the absolute volume of business will decrease. Furthermore, competition may actually increase the projected lives of basic telephone assets because service providers will have greater incentive to maximize the use of network components already deployed.

Further, because any technological "obsolescence" that does occur may reflect broadband initiatives, not forward-looking narrowband technologies, the Commission should make clear that any downward adjustment in asset lives made in its forthcoming rulemaking (see FNPRM ¶ 153) will not be reflected in universal service cost models absent compelling evidence that the aforementioned criteria have been satisfied. It plainly would be inappropriate and inefficient for basic telephone customers to subsidize services not related to universal service. See FNPRM ¶ 152.

V. THE HATFIELD MODEL ESTIMATES THE EXPENSES AN EFFICIENT UNIVERSAL SERVICE PROVIDER WOULD INCUR.

The expenses that should be reflected in a forward-looking cost model are the costs that an efficient forward-looking company would face. Thus, in an ideal world, the cost model's expense factors would reflect what would be expected in the future, rather than what is reflected in the LECs' embedded costs, as reported in ARMIS. However, in many cases, there is no publicly available data on forward-looking costs, so the Hatfield Model, by necessity, relies on the expense to investment relationships that exist within the LECs' ARMIS data. In other cases, there exist cost studies performed by the LECs or other relevant cost information which can be used to compute forward-looking costs, and the Hatfield Model uses such information when it is available.

The Commission tentatively concludes that the cost model should allow the user the option to compute expenses on either a per line or per investment basis. AT&T and MCI believe that improper use of such an approach could mislead because certain categories of expense are more closely affected by the number of lines, while others are more closely tied to the level of investment. The cost model should use cost factors that are consistent with the characteristic of the cost in question. Thus, as discussed in more detail infra, expenses which will vary closely with the overall level of operations, e.g., corporate operations, are best estimated as a percent of direct costs, while other expenses, e.g., billing, are more directly related to the number of lines served. The cost model should determine the level of these costs in a cost-causative manner.[37]

The Commission asks for comment on the BCPM's estimate of $11.34 per line for total expenses. AT&T and MCI cannot comment fully on this figure, because we have not been permitted to inspect the proprietary survey on which it is based. We note, however, that the amount seems excessive in light of the LECs' current expenses, and even more so in light of the increased efficiencies which can be expected in a competitive environment. We discuss below the specific expenses and their correct expense factors.

A. Plant Specific Expenses

Plant specific expenses are the expenses associated with the maintenance and repair of particular types of plant -- e.g., NID, drop, distribution, SAI, circuit equipment, feeder, and

[37] As noted infra, some costs, such as general support or overheads may reasonably vary with either lines or investment. The next release of the Hatfield Model will allow the user an option of specifying flexibly such expenses on a per line and a per dollar of direct costs basis.

switching. Except for the NID, the expenses associated with these types of plant will vary more by total investment than by line. For example, maintenance and repair expenses for cable and wire facilities will not vary significantly by the number of lines served on this plant, because the likelihood of damage to a cable is more a function of the length of the cable, and thus of the total investment, rather than the number of customers served by that cable. Similarly, maintenance and repair of the switch will be determined by the size of the switch. Since the switch has a large non-traffic sensitive component, the size of the switch can be more accurately assessed by the total investment than by the number of lines served by the switch. Therefore, Hatfield Model 4.0 develops these plant specific expenses through the use of expense to investment ratios.

Conversely, the costs for repair and maintenance of the NID is determined by the number of NIDs in place and their failure rate. Since the number of NIDs depends very closely on the number of lines, the expense associated with NIDs is developed using a per-line factor.

The Commission asks whether maintenance expense should vary based on the type of plant, especially whether aerial cable implies a higher maintenance expense. Until the Commission's recent data request, there had been no publicly available data on the difference in maintenance costs for the types of plant. As discussed supra, the Hatfield Model developers are working on a revision which will use these newly available data to develop different maintenance costs for different types of plant. Then, within certain parameters, the model will select the optimal mix of plant types based on their relative life cycle cost.

Finally, the Commission asks whether plant specific expenses should vary by climate or soil type. The Hatfield Model uses ratios of expenses to investment from ARMIS to determine the level of plant specific expenses. Since these ratios are company specific, they already reflect the climate and soil type the company faces. Thus, there is no need to adjust these ratios further.

B. Plant Non-Specific Expenses

Plant Non-Specific expenses, or network operations, are reported in several Part 32 accounts: (1) Account 6512 - Provisioning Expenses; (2) Account 6531 - Power Expenses; (3) Account 6532 - Network Administration; (4) Account 6533 - Testing; (5) Account 6534 - Plant Operations Administration, and; (6) Account 6535 - Engineering. The Hatfield Model includes these costs at 50 percent of their embedded per-line level, as reported in ARMIS. Computation of these expenses on a per-line basis is appropriate because these functions are strongly dependent on the number of lines served. Furthermore, there are a number of specific and general reasons why the reduction in per-line levels incorporated in the Hatfield Model estimates is expected.

First, each of these categories should see reductions from embedded levels because of advancements in the technology used in the network. In Account 6512 - Network Provisioning, new technologies such as the Telecommunications Management Network ("TMN") standards, procedures, and systems, and Digital Cross-Connect Systems ("DCS") provide for much more centralized access and control, and more self-provisioning by customers, both of which will result in lower costs. The cost of inventory included in this account will also be reduced, due to Electronic Data Interchange, intranet technology, and increased use of bar coding for tracking inventory. Greater emphasis on quality control in network provisioning should also reduce costs, as less labor is needed to respond to network failures.

Second, power expenses reported in Account 6531 should be reduced, because the new all digital technology reflected in the forward-looking cost model requires less power than the analog or older model digital equipment in the LECs' embedded network. Greater centralization of other plant will require less power, as fewer buildings need power less of the time. Finally, the increased competition which is occurring or will soon occur in the electric power industry will result in lower electric rates for large customers, such as the incumbent and competitive LECs.

Third, Network Administration costs in Account 6532 and Testing expense in Account 6533 will benefit from the deployment of SONET-based transport. Due to the improved monitoring of the network made possible by SONET, outages are reduced, and more proactive, less costly preventative maintenance can be scheduled. Indeed, fiber and SONET are often adopted in the network on the assumption that they will produce these operational savings. In addition, testing activities are increasingly being performed by contractors, reducing LEC labor costs, and the use of "hot spares" reduces the need for out-of-hours dispatch of workers for emergency restoration of service, reducing overtime costs.

Fourth, there is a growing tendency for vendors to provide the installation and ongoing maintenance of their equipment. This reduces the need for LEC engineers, and requires fewer managers to oversee these engineers, thus lowering costs reported in Account 6534, Plant Operations and Administration. Finally, Engineering expenses in account 6535 will be reduced as engineering of specific elements and services become more automated, or is performed by purchasers of unbundled elements.

In addition to these account-specific reasons for reductions in forward-looking non-plant specific expenses, there are a number of general reasons to reduce these expenses from embedded levels. First, network operations expenses have been declining in recent years, and this trend should continue. Even the estimate of network operations costs by the proponents of the BCPM is below embedded levels, and in fact is below the level reflected in the Hatfield Model. Finally, a number of the costs booked in plant non-specific expense accounts are recovered through non-recurring charges paid by end-users. To prevent double-recovery of these costs, they must not also be included in the LECs' recurring costs.

C. Customer Service Expenses

Customer service expenses are reported in Marketing - Account 6610, and Services - Account 6620. The Hatfield Model includes per-line costs for billing, directory listing, local number portability, and carrier-to-carrier customer service. Each of these functions will need to be performed in the forward-looking network providing universal service. However, no traditional marketing expenses, such as advertising, will be necessary, as customers will not need to be convinced to purchase this basic service.[38]

The Hatfield Model believes applying these costs on a per line basis is most appropriate. Billing costs vary primarily with the number of lines billed rather than with total investment, because each line must be billed. Similarly, directory listing and local number portability costs will vary with the number of lines in place, as the number of lines will determine the size and cost of the databases necessary to provide these functions. The default costs in the Hatfield Model are documented in the HIP.

D. Corporate Operations Expenses

The Hatfield Model develops corporate operations expenses, which include Executive, Planning, and General and Administrative costs based on data from AT&T's Form M.[39] Use of

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[38] Similarly, if the cost model is used to price unbundled network elements, no marketing expense should be included, because there is no alternative provider of the UNEs.

[39] The data used are presented in the HIP, Appendix C, page 136.

these data is appropriate, because, like the LECs, AT&T provides telecommunications service, but unlike the LECs, AT&T has faced a competitive market which has provided the discipline to force AT&T to restrain its corporate overhead expenses. This provides the best available estimate of the appropriate forward-looking corporate expenses. The Hatfield Model has used this multiplier (10.4% of direct expenses) because these overhead expenses should vary by the overall size of operations. However, should the Commission decide that these expenses are best estimated on a per line basis, the next version of the Hatfield Model will allow the user the option to specify these costs on either a per-line basis or as the current percent of direct costs.

The Hatfield Model also makes provision for uncollectibles by applying the most recent ARMIS ratio of Uncollectibles to total revenues. This provides the best publicly available estimate of forward-looking uncollectibles. This ratio is applied to the model costs to gross them up for uncollectibles.

E. General Support Facilities

General support facilities ("GSF") includes furniture, office equipment, general purpose computers, buildings, motor vehicles, garage work equipment, and other work equipment. With the exception of wire center buildings, the Hatfield Model reasonably assumes that expenditures on these facilities will vary with the size of the firm. See FNPRM ¶ 148. For example, a smaller local service provider would usually have lower motor vehicle expenses than a larger one. By the same token, a more efficient firm typically will have lower GSF expenses than an inefficient one. Hence the Model's designers take the reasonable approach of scaling an incumbent LEC's GSF expenditures down to quantities commensurate with an efficient firm that provides only those services related to universal service. Even this method may overstate efficient GSF expenditures because it does not capture the economies of scale and scope the incumbent actually enjoys.

The majority state Joint Board members concluded that many of these GSF expenses should be calculated based on historic costs "adjusted to reflect forward-looking costs." FNPRM ¶ 147. Hatfield Model 4.0 takes precisely this approach in a four step process. First, the model uses ARMIS data to determine the ratio between investment in each of the GSF categories to historic network investment. The same ratios are then applied to the network investment estimated by the Model to determine the GSF investment for each category in an efficient basic telephone service network. Second, the recurring costs for these facilities, specifically capital carrying costs and operating expenses, are calculated from the investments in the same manner as the recurring costs for other network components. Third, the ratio between operating expenses in customer operations and corporate operations to total operating expenses as reported in ARMIS data is used to assign a portion of the estimated GSF expenses to these categories in the Model. Finally, the remaining costs are assigned directly to various network elements. The Hatfield Model's reliance on recent ARMIS data to determine investment ratios allows the Model to capture the increased importance businesses are placing on computers (FNPRM ¶ 148) and the different land values in each incumbent LEC's service area. Id.[40]

The Hatfield Model takes a different approach to calculating investment in wire center buildings than other general support facilities. As the Commission recognizes, the Model assumes that the building housing a switch or switches depend on the size and number of switches. Id.

[40] BCPM, by contrast, employs a single ratio for all GSF expenses.

¶ 144.[41] While a larger switch in and of itself does not necessarily require greater physical space, the increase in auxiliary equipment and personnel that support a larger switch's operation will necessitate more space. Moreover, larger switches will be most common in urban areas where, even if the building size were not to increase, the cost per foot of wire center space most likely would be significantly higher.

VI. UNIVERSAL SERVICE COSTS SHOULD NOT BE ADJUSTED ANNUALLY FOR INFLATION AND PRODUCTIVITY OFFSETS.

The Commission has sought comment on the best method of adjusting universal service costs over time. FNPRM ¶ 173. AT&T and MCI believe that, initially, periodic reassessment of costs is superior to annual adjustments based on inflation and productivity offsets. The obstacles to developing a universal service cost mechanism have already proven formidable and would only be exacerbated by attempts to properly address these additional factors. The cost model selected should be a model of forward-looking network practice and, until the technology used in networks changes significantly, variations in cost can be determined by simply adjusting the inputs to reflect changes in conditions and then rerunning the model. Productivity gains and inflation will be captured if the inputs are appropriately adjusted.

In addition to simplicity, this approach would have the added benefit of incenting incumbent and competitive LECs to find more efficient means of providing basic telephone services.[42] It is also a very conservative approach given that (i) the cost of capital in the models is

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[41] The Hatfield designers are investigating the use of a more elaborate set of cost drivers in future releases of the Model.

[42] Like price cap regulation, fixed universal service costs provide incentives for local service providers to develop more cost effective methods of serving customers because the providers will be allowed to keep the profits from these gains until the universal service costs are reassessed. If (continued. . .)

a nominal cost of capital incorporating anticipated inflation and (ii) the Commission has found annual productivity gains in local telecommunications in the 6.5% range.[43]

VII. UNIVERSAL SERVICE SUPPORT AREAS SHOULD BE COINCIDENT WITH THE AREAS USED TO PRICE UNBUNDLED NETWORK ELEMENTS.

The Commission has sought comment on what geographic area should be used to calculate cost support. FNPRM ¶ 176. In order to promote efficient local telephone service competition, the Universal Service Fund should provide support for the same geographic unit used to price unbundled network elements. The correspondence between these two units of measurement is more important than their size.[44] If universal service subsidies are provided for an area larger than the UNE pricing area, local service providers may not find it profitable to serve high cost areas. On the other hand, universal service areas smaller than the UNE pricing area may discourage service to low cost areas.

For example, consider two contiguous areas that have a single UNE "platform" cost of $15. In fact, if these UNE costs had been calculated separately for each area, they would have cost $20 in the first area and $10 in the second. If the Commission determines that the

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(. . . continued)
the period between reassessments is too long, however, customers will be unnecessarily delayed from enjoying the benefits of these productivity gains.

[43] See Price Cap Performance Review for Local Exchange Carriers, Access Charge Reform, "Fourth Report and Order in CC Docket No. 94-1 and Second Report and Order in CC Docket No. 96-262," CC Docket Nos. 94-1, 96-262 ¶ 1 (released May 21, 1997).

[44] AT&T and MCI have discussed in their previous comments the inherent difficulties in using smaller and smaller geographic units to determine universal service costs. See AT&T and MCI Comments at 3-5 (filed Sep. 2, 1997). In this regard, it is critical that the selected cost mechanism not demand more accuracy than the available data can reveal.

affordability benchmark is $12 and that the universal service area is coincident with the UNE pricing area, entrants would receive a $3 subsidy ($15-$12) for each customer they serve in either area. If, on the other hand, the Commission established separate universal service support payments for each area, entrants would have no incentive to serve customers in the lower cost area because it would cost $15 per customer (the UNE rate), and they would not receive any subsidy ($10 is less than the affordability benchmark of $12) above the $12 retail rate. Similarly, if the same two areas are subject to separate UNE charges of $10 and $20 but are part of a single universal service area with a cost of $15, no entrant will serve the high cost area, because the $20 UNE charge less a $3 subsidy ($15 - $12) exceeds the retail rate of $12 by $5.

In all events, the Commission must ensure that no universal service support area is so large that it constitutes a barrier to entry, rather than a mechanism for ensuring affordable basic telephone service. If, for example, a state defines its universal service area as the state's entire geographic area, the Commission should instead use smaller support areas such as the zones provided by the Hatfield Model.

VIII. THE LOCAL USAGE REQUIREMENT ADOPTED IN THIS PROCEEDING SHOULD BE TECHNOLOGY NEUTRAL AND GIVE SUPPORTED USERS THE SAME INCENTIVES AS NON-SUPPORTED USERS.

The Commission has tentatively concluded that universal service should include a minimum local usage component. FNPRM ¶ 178. The Commission must ensure, however, that any minimum local usage requirement for universal service is technologically neutral. For example, if local service requirements are set too high, carriers using other technologies such as wireless or possibly cable telephony may be economically foreclosed from providing universal service, thereby undermining the Commission's commitment to providing consumer choice among a wide range of competing carriers and technologies.[45] In addition, the amount of local usage that should be included in the definition of universal service should be lower than current average usage levels, which reflect services such as multiple line business services that should not receive universal service support. Finally, if the free usage level is set too high, customers who receive universal service support will not face the same incentives to choose an efficient level of usage as non-supported customers who must pay per minute or per call charges associated with their telephone calls.

[45] For example, Bell Atlantic's recommendation of a 500 minute per month local usage component (see FRPRM ¶ 281) might preclude wireless service providers or other technologies that exhibit relatively low fixed costs, but high usage costs, from competing for universal service customers -- even when their overall costs for certain customers are lower. This would deny customers the opportunity to determine that a wireless, mobile offering at a lower usage level is as or more valuable to them than a wireline offering with higher usage levels.

CONCLUSION

For the foregoing reasons, the Commission should adopt the evolving Hatfield Model approach to the designated issues raised in the Notice.

Respectfully submitted,

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October 17, 1997

APPENDIX: HATFIELD MODEL RELEASE 4.0 INPUTS PORTFOLIO

Hatfield Model

Release 4.0

Inputs Portfolio

Hatfield Associates, Inc.

737 29th Street, Suite 200
Boulder, Colorado 80303

August 1, 1997

Hatfield Model Release 4.0 Inputs Portfolio

Table of Contents

Page

Table of Contents

Page

Table of Contents

Page

Table of Contents

Table of Contents

Table of Contents

1. OVERVIEW

This draft document contains descriptions of the user-adjustable inputs to the Hatfield Model, version 4.0 ("HM4.0"), the default values assigned to the inputs, and the rationales and supporting evidence for these default values. The inputs and assumptions in HM4.0 are based on information in publicly available documents, expert engineering judgment, or price quotes from suppliers and contractors.

Prices of telecommunications equipment and materials are notoriously difficult to obtain from manufacturers and large sales organizations. Although salespeople will occasionally provide "ballpark" prices, they will do so only informally and with the caveat that they may not be quoted and the company's identity must be concealed. It is very nearly impossible to obtain written, and hence "citable," price quotations, even for "list" prices, from vendors of equipment, cable and wire, and other items that are used in the telecommunications infrastructure. Part of the reason for this is that the vendors have long-standing relationships with the principal users of such equipment, the incumbent local exchange carriers ("ILECs"), and they apparently believe that public disclosure of any prices, list or discounted, might jeopardize these relationships. Further, they may fear retaliation by the ILECs if they were to provide pricing explicitly for use in cost models such as HM4.0.[1] The HM4.0 developers thus have often been forced to rely on informal discussions with vendor representatives and personal experience in purchasing or recommending such equipment and materials. Nevertheless, a great deal of experience and expertise in the industry underlies the estimates, where they were necessary to augment explicit, publicly-available information.

This document contains a number of graphs that illustrate a range of prices for particular kinds of telecommunications equipment. The information contained in these graphs was gathered to validate the opinions of outside plant experts who used their collective industry knowledge and experience to estimate the costs of particular items.

This document will continue to evolve as more documented sources are found to support the input values and assumptions.

Organization of Material:
Material is generally organized in this binder in the same order as default values appear in Model Input screens in the Hatfield Model.

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[1] See, for example, "U S West to Suppliers: Back Us or Lose Business," *Inter@ctive Week*, September 16, 1996.